Accounting Models of the Human Factor and its Architecture in Scheduling and Acceptance of Administrative Solutions

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ABSTRACT

Peace support, combat, antiterrorist, search and rescue operations demands exact scheduling and fast preparation of administrative orders with taking into account physical, mental and psychical condition of staff and the possible consequences for their life and health. The proposed methodology for system-vector approach to combine results of many studies and actual data in a single model of architecture, standards and principles of decision making that can adequately evaluate and predict the professional activities of man, his physical and mental condition. Based on the methodology proposed ways to improve the planning of peacekeeping, antiterrorist, search and rescue operations. The methodology also allows the system to improve medical support operations, design and evaluate the equipment and personal protection equipment. The methodology can be used to create computer programs information support management decisions.

INTRODUCTION

Forecasts early 90's, in which anticipated growth in world stability, security and integration, not come true [1]. The world is more dangerous and dismal [2]. The danger of military conflicts of varying intensity and terrorist attacks are a reality today.

NATO forces are increasingly involved to conduct peacekeeping, anti-terrorism, search and rescue and humanitarian operations under UN auspices. Peace support, search and rescue, anti-terrorism operations require careful planning, rapid decision-making, taking into account the human factor and the possible consequences. Organization and planning of such operations meet with many difficulties. Operations can be conducted in the climatic and geographical conditions that are radically different from the conditions in places of permanent deployment of NATO units. In most cases, the time allotted for the preparation of the

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[1]. Annan K. A., Millennium Report of the Secretary-General of the United Nations, We, the Peoples, The Role of the United Nations in the 21st Century, UN document A/54/2000, 3 Apr. 2000, pp. 5-6, available at URL http://www.un.org/millennium/sg/report/ .

[2]. Щорічник СІПРІ 2002: Озброєння, роззброєння та міжнародна безпека/ Пер. з англ.., Українське видання Щорічника СІПРІ підготовлене спільно Стокгольмським міжнародним інститутом дослідження миру та Українським центром економічних і політичних досліджень імені Олександра Разумкова.– К. „Заповіт": 2002. – 800 с

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14. ABSTRACT
Peace support, combat, antiterrorist, search and rescue operations demands exact scheduling and fast preparation of administrative orders with taking into account physical, mental and psychical condition of staff and the possible consequences for their life and health. The proposed methodology for system-vector approach to combine results of many studies and actual data in a single model of architecture, standards and principles of decision making that can adequately evaluate and predict the professional activities of man, his physical and mental condition. Based on the methodology proposed ways to improve the planning of peacekeeping, antiterrorist, search and rescue operations. The methodology also allows the system to improve medical support operations, design and evaluate the equipment and personal protection equipment. The methodology can be used to create computer programs information support management decisions.

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operation is limited, since the operation is a forced reaction to the already existing situation. Regions of operations often have sanitary and epidemiological hazard.

The continuing threat of use of chemical weapons in the conflict. Growing number of countries with their own nuclear program weapons and nuclear energy and could potentially get hold of nuclear and radiological weapons.

Appear are new dangers. Many countries and terrorist organizations have access to technology making radiological, chemical and biological weapons.

There is a possibility of use as chemical and radiological weapons or terrorist acts of radioactive materials, highly toxic compounds of agricultural and industrial use. To create a mass destruction may also deliberately shatter the dangerous production, storehouse, transport. In view of technogenic load, increased the risk of large-scale accidents at hazardous production (radiation, chemical, biological) that are not associated with terrorism or fighting, as for example in Bhopal, Goiânia, Chernobyl, Novosibirsk. General global trend is an extension of the tasks from military medicine to medicine of catastrophes. This requires serious revision of the organization of medical service to the extent that goes beyond the treatment and evacuation support.

There are many studies that focus on the impact of certain environmental factors on people. At the same time, the lack of common methodological approaches, traditionalism in the views of individual schools and the constant evolution of threats, protection and military equipment is not allowed to present a structured system of medical support of troops during the various operations that would meet current needs.

Thus, pooling many studies and actual data in a single model of architecture, standards and principles of decision making which could adequately evaluate and predict the professional activities of man, his physical and mental condition is an actual problem for the practice and science. One way to improve planning of peacekeeping operations is to create computer software information to support decision-making.

METHODS

To construct a mathematical tool for planning, forecasting and decision-making control, we used data on direct indicators of occupational performance and functional status of specialists. Employees performed the work with certain physical, informational and emotional workload. Microclimatic conditions to match WBGT 22°C, 26°C, 29°C (dry hot climate), 29°C (humid hot climate). These data were also the basis of computer simulations.

RESULTS, DISCUSSION

Structure functioning of military medical service for the operations in the part that goes beyond the treatment and evacuation is given in Figure 1. The urgent demand of such operations is the principle performs the required tasks without consequences for the lives, health and professional longevity of members of the operation.
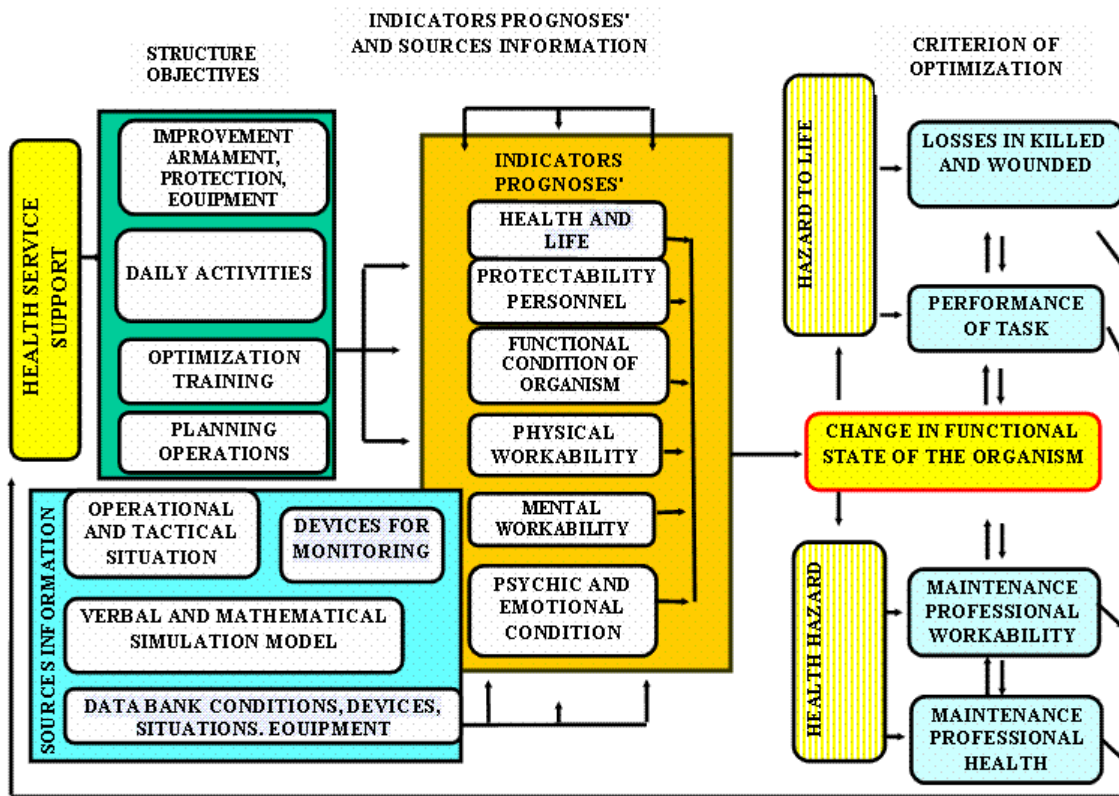
Figure 1: Functioning system of medical support operations.

System-vector approach to medical support of troops provides a package of measures agreed upon by time, place, performers, material resources, organizational and information support. These measures are primarily aimed at protecting life, health, professional performance and professional longevity.

To create a plan of operations and forecasting was developed formal description of the system (Fig. 2) "ENVIRONMENT – EQUIPMENT - HUMAN BODY - RESULT OF WORK".
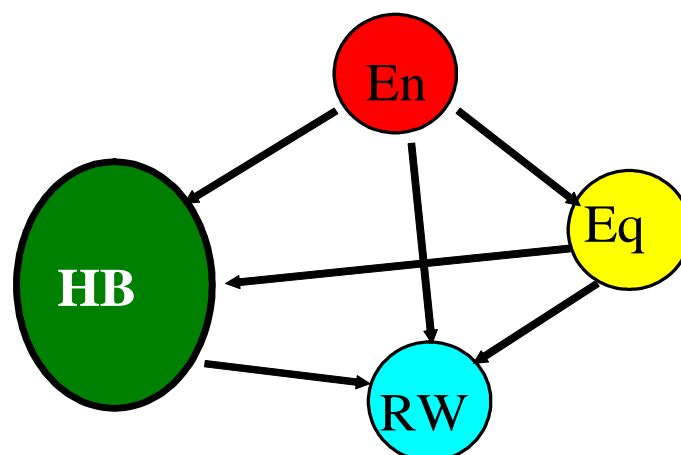

**Figure 2: System structure "ENVIRONMENT (En) – EQUIPMENT (Eq) –
HUMAN BODY (HB) – RESULT OF WORK (RW)".**

In general form the dependence of the results OF WORK of military specialists in such a system can describe the equation:

$$RW=F\{Xi\}\ i=1,n \quad \text{or} \quad RW=F(X,X,...Xi,...Xn)\ i=1,n, \quad \text{this} \tag{1}$$

RW - the result of work of the system;

X ... Xn - significant elements of the system;

F - function that determines the dependence of the results of work system from its constituent elements.

However, each element of the system is a vector, which in turn consists of many factors:

$$X=(Z,Z,...,Zi,...Zn), i=1,n \tag{2}$$

For example, only one element that characterizes the environment - climate may be described by four basic parameters: temperature, thermal radiation, humidity, air mobility and many other, equally important indicators.

Therefore, in each case the conditions of the system (z) dependence (1) will be:

$$RW(z)=F(X(z),X(z),...,Xi(z),...,Xn(z))\ i=1,n, \quad \text{this} \tag{3}$$

X (z)...Xn(z) - concrete set of significant elements of their concrete characteristics for these conditions (environment, workloads, equipment, etc.)

Given considerable the dynamics and interference of elements next formal description, was made subject to requirements that used to describe a number of consecutive events that occur with certain hysteresis (delayed) which together with the actual state of the system is an important system status (separate sequential events) in earlier time.

Using correction element in, we received a methodical approach, which is quite universal and allows to forecast and optimize operations plan, evaluate existing and hypothetical model of defense technology, equipment, protection in terms the functioning of human-level system.
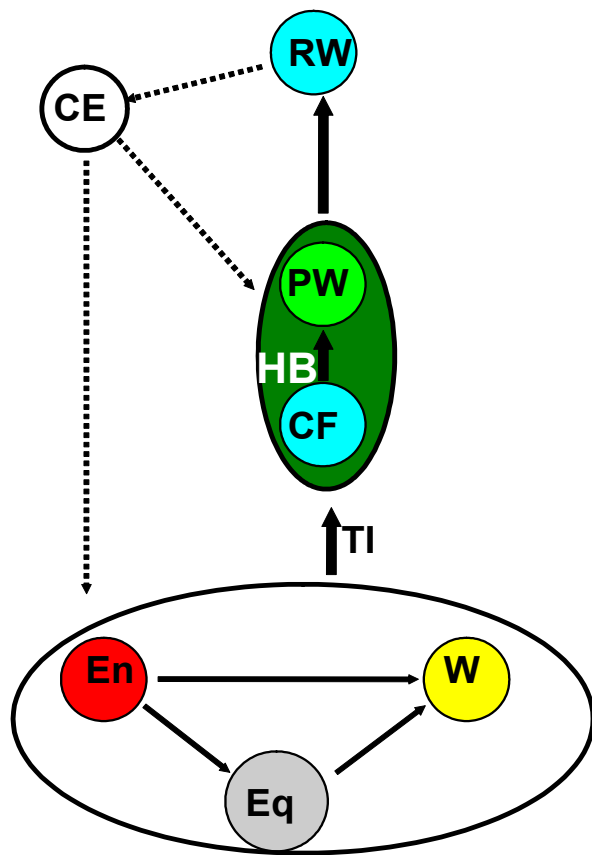
Accordingly, the hierarchical structure of the system (Fig. 3.) may be submitted system of equations 4.

Vector, which determines the influence of the environment (En) consists of a series of physical, chemical, biological, and informational factors.

Factors vector En can also be divided into threats and environmental conditions of natural derivation and threats created by the warring parties.

The threats and environmental conditions of natural origin, which affect the functional state of the human body combine physical, chemical, biological groups of factors.

- Physical: high or low temperature, humidity, insolation, the barometric pressure.

- Chemical: changes in gas composition of air of natural origin (oxygen, carbon dioxide, toxic compounds).

- Biological: endemic infections, dangerous insects and animals.

$$RW_{\tau2}= RW_{\tau1}+f(PW, En2) \qquad (4)$$
$$PW_{\tau2} = PW_{\tau1}+f(CF, RC, A)$$
$$CF_{\tau2} = CF_{\tau1}+f(RC,A)$$
$$RC_{\tau2} = RC_{\tau1}+f(En1, W, Eq, A), this$$

En - Vector of an environment and danger

W - workload

Eq- equipment (personal protective equipment);

TI - Vector representing total influence of all factors of an environment, hazard, workload, equipment, protective equipment on the organism;

CF - Functional condition of an organism;

PW - Organism parameters important for work;

RW - Result of work;

CE - Correction element.

**Figure 3: Hierarchical structure of the system "ENVIRONMENT –
EQUIPMENT – HUMAN BODY – RESULT OF WORK".**

The danger and environmental conditions of natural origin, which affect the functional state of the human body combine physical, chemical, biological groups of factors.

- Physical: high or low temperature, humidity, insolation, the barometric pressure.

- Chemical: changes in gas composition of air of natural origin (oxygen, carbon dioxide, toxic compounds).

- Biological: endemic infections, dangerous insects and animals.

Vector equipment and protective equipment (Eq) describes the physiological and hygienic characteristics of clothing, shoes, uniforms, personal protective equipment includes such indicators as weight, thermal characteristics, ergonomics, etc. For example, the gas mask is estimated at more than 20 physiological and hygienic parameters.

The vector system of regulatory and homeostatic body functions (CF) enables to evaluate the net result effect of working conditions on the organism, the physiological cost of work and the dynamics of fatigue (recovery) of the organism.

The most informative indicator is the maximum time in specific circumstances and indicators of functional state of the organism staff. This often heart rate, core body temperature and sweat loss.

However, not a specific indicator of functional status that would allow unambiguously compare the functional state of the body at different stages of the work or the application of various remedies. It is

connected with a specific feature of the influence of equipment and personal protective equipment standard on functional status, and features personal reactions to specific workload.

To evaluate the functional state of personnel use the most informative indicators of functional body systems that are crucial to these terms of: cardiovascular (heart rate) and of thermoregulatory (core body temperature and sweat loss). For general evaluation of functional status appropriate to use integrated indices. They were based on the indicators that transformed in the same range of changes. The calculation was made using the principle of unification of the range which offered Craig [3] to calculate the index of physiological effect (I):

$$I = \frac{A_3 - A_1}{A_2 - A_1} \times 100 \quad , \quad \text{this}$$

(5)

$$I = I_A + I_B + \ldots + I_Z$$

A_1 – value parameter of functional status for comfortable conditions;
A_2 – maximum value for this parameter;
A_3 – value parameter in experiment.
I_A, I_B, ..., I_Z – a list parameters of functional state, which investigated.

Koschyeyev V.S. et al [4] to assess the functional tension at work propose a modification index Craig (U):

$$\bigcup = \sum K_\iota \frac{\Delta P}{P_O} \quad , \text{this}$$

(6)

ΔP – changes of functional state in the experiment comparing with its optimal value;
P_o – optimal value of this parameter;
K_i – contribution ratio of each parameter in the tension of functional state.

We made analysis of theoretical approaches that are applied in developing these indices. These indices were used to analyze the data of our own experiments. All this is allowed to make a definite conclusion about their value and make three new indices.

Index of functional tension Craig we have modified and defined as the average change of indicators used for its calculation:

$$\mathbf{IFTO} = \left(\frac{P - 70}{100} + \frac{T - 36{,}5}{2} + \frac{M}{2} \right) \div 3 , \quad \text{this}$$

(7)

IFTO – index of the functional tension organism systems (index FTO).
P – pulse rate at the time of measurement, beats / min;
T – rectal temperature at the time of measurement, °C;
M – sweat loss at the time of measurement, kg/hr;

Assumed that the application of the index makes a definite conclusion about the critical state of functional mechanisms in a given time (estimate at one point). To evaluate the alterations of the functional state over a period of activity, especially if changes of functional state were nonlinear nature, the definition of this index is inadequate. Index FTO ignores time factor, i.e. it does not account for the duration of functional

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[3].Craig RP (1984) Military cold injury during the war in the Falkland Islands 1982: an evaluation of possible risk factors. J Roy Arm Med Corps 136: 89–96.

[4].Кощеев В.С., Кузнец Е.И. Физиология и гигиена индивидуальной защиты человека в условиях высоких температур. - М.: Медицина, 1986, 256 с..

deviations from the norm, and it is imperative to assess fatigue, functional reserves of the body, heat exhaustion. To assess changes in functional status over time the index FTO was integrated over time and get the index FTO -I:

$$\mathbf{IFTO-I} = \int_{\tau_0}^{\tau_1} \left(\left(\frac{P-70}{100} + \frac{T-36,5}{2} + \frac{M}{2} \right) \div 3 \right) d\tau, \text{ this} \tag{8}$$

τ_1 – time workload, hour.

To evaluate the equipment was proposed biometric index (I_{BIO}), which allows estimating the speed of change functional state:

$$I_{BIO} = \left(\left(\frac{P-70}{\tau_1 * 100} \right) * 60 + \left(\frac{T-36,5}{\tau_1 * 2} \right) * 60 + \left(\frac{M}{\tau_1 * 2} \right) * 60 \right) \div 3 \quad , \tag{9}$$

this τ_1 – time workload, hour.

Analysis of experimental data revealed that the index FTO determines the ability of workers to continue working at the time and make a brief prognosis conditions for these activities. Its value within 0.1 - 0.5 show that the work can be continued, when a change of this index within 0.5 - 0.7 is usually one of the criteria of functional status beyond the maximum permissible values. When changes of this index are within 0.8 - 0.9 value of all criteria of functional state, usually exceeding the maximum permissible level.

Integral value of this index FTO-I shows the state of body reserves and the possibility of recovery. If the value of this index is less than 0.6 professional capacities can be restored in 3-4 hours by 90%.

Biometric index answers the question whether suitable equipment (personal protective equipment) for the climatic conditions and workload.

If its value does not exceed 0.2, the length of professional activity in the real conditions is not limited to indicators of functional state of the organism. Within 0,2-0,8 observed backward-proportional dependence of the duration and magnitude of this index.

If the index is 0.8 larger equipment (clothing, personal protective equipment) does not meet the climatic conditions of work and workload. Work in these cases from the first minute runs on the background of expressed changes in the functional state of the body and a limited 10-30 minutes.

Correlation analysis confirmed informative developed indices. In Table. 1 presents the correlation coefficient indexes developed with other indicators that were received in the performance test of individual endurance for physical workload and heat resistance.

Table 1: Correlation Coefficients Indexes Developed of Functional Status with Other Indicators.

	Index FTO	Index FTO-I	Biometric Index
Maximum time to work	0,41	0,78	0,93
Subjective self-assessment of health (self-feelings) at during work	0,9	0,82	0,86
Expert evaluation of thermal characteristics of equipment	0,2	-0,44	0,9
The speed of recovery of functional status	0,53	0,94	-0,2

Vector (PW) - Parameters human which are important for work. It also displays the functional state of the organism, but is focusing on the important parameters for successful professional activity (physical power, reaction speed, sensorimotor coordination, thinking, attention, long-term and operational memory, etc.)

To determine the success of professional activity in each particular point of time was offered a formula aggregated factor for determining professional capacity for work ($A_{ПП}$). It is calculated for separate components of professional work and can correctly use the experimental data for the forecast of real people. With all the indicators act as equal size, the specific contribution which is determined by the requirements of professional work.

$$A_{ПП} = \frac{1}{n} * \sum_{i=1}^{n} k_i * \left| \frac{(\chi_i - \chi_{min})}{(\chi_{max} - \chi_{min})} \right|$$ (10)

, this

n – quantity of important parameters of professional capacity for work ;
k – weight coefficients of each parameter of professional capacity for work , which is defined;
xi – parameter value is at the time of study;
xmin – minimum value of this parameter;
xmax – maximum value of this parameter.

Evaluation of efficiency for the entire period of work carried out on indicators of efficiency (Pi), which takes into account changes in quantitative and qualitative parameters of professional activities and their contribution to the final result:

$$\Pi_I = \int_{\tau_o}^{\tau_\phi} f(A_{ПП}) * d\tau$$ (11)

, this

Π_i – integral of all the works for all time experiment;
t_0, t_ϕ – time, respectively, the beginning and of the actual finish of work;
$A_{ПП}$ – aggregated factor for determining professional capacity for work;
$d\tau$ – time integral.

Effectiveness of professional military expert estimated as the ratio obtained generalized index of efficiency to the required values:

$$E = \int_{\tau_o}^{\tau_\phi} f(A_{ПП}^\Phi) * d\tau \left/ \int_{\tau_o}^{\tau_H} f(A_{ПП}^H) * d\tau \right.$$ (12)

, this

$A_{ПП}^{Ф}$ – actual value aggregated factor for determining professional capacity for work;

$A_{ПП}^{Н}$ – necessary value aggregated factor for determining professional capacity for work

t_0, $t_ф$, $t_н$ – time, respectively, the beginning work, the actual completion of work and time required.

The central element of the system - defining the functions (f) of communication indices of professional capacity for work and the functional state of the body. If the task consists of several stages, the effectiveness of professional military specialist evaluated each step.

Vector (W-workload) gives an estimate of workloads for the entire period, which is planned. Traditionally, all kinds of work are divided into mental work and physical work. But any job is a more complex combination of different loads, they violate the functional state of the body and cause fatigue. Each task should be considered as a combination of physical, informational and psycho-emotional load, should take into account the duration of each component of the work separately. For ease of planning and forecasting task should be divided into successive stages with the same structure and level loads.

Analysis of literature data and own investigations have allowed all kinds of work during operations divided into six categories on the energy cost (Table 2).

In the real circumstances, physical activities are closely linked with the algorithm of professional activity during a specific operation, preparations for it and certain types of training. Formally, this algorithm can be described as hour-power parameters.

Table 2: Energy cost under certain types of work during operation.

Energy cost, W	The list of works that belong to this category
Less 210 (no workload)	rest waiting in full combat readiness,
Less 300 (light workload)	march using transport, attack using technique, of radio communication, withdraw from battle, maintenance of equipment and weapons, work operators, staff officer and others
Less 370 (medium workload)	foot march order (speed 4-5 km/h), repair techniques, off road driving, of decontamination, defensive battle
Less 440 (medium heavy workload)	rescue, overcoming obstacles, attack of enemy foot procedure, crawl on their stomach
Less 510 (heavy workload)	Engineering work, of artillery fire, elimination of the disaster involving weapons of mass destruction
Less 580 (very heavy workload)	quick march in full equipment, cargo work in high pace, march in wooded or swampy terrain foot procedure

The Fig. 4 shows the example of hour-power parameters for personnel conditional military sub-unit.
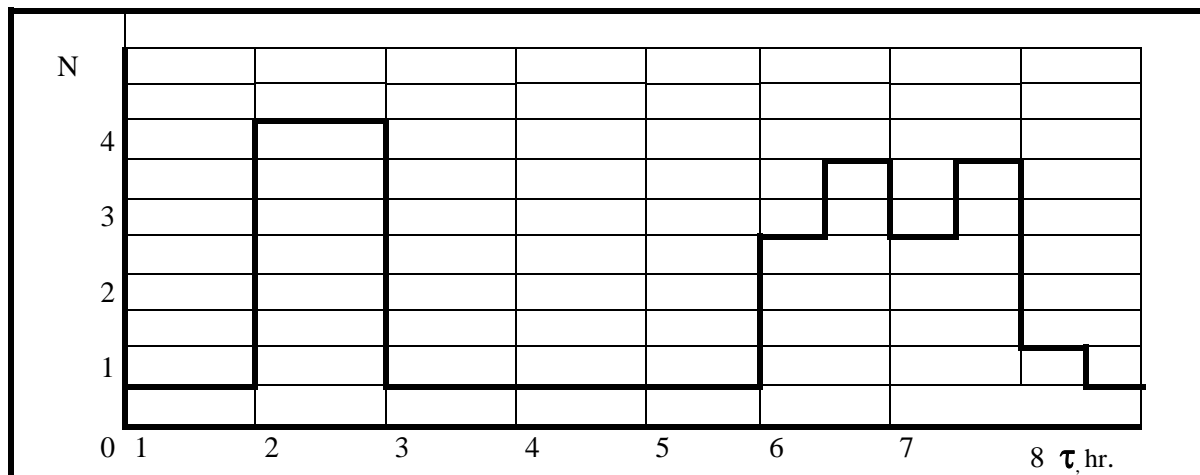
Figure 4: Example of hour-power parameters for personnel conditional military sub-unit.
N, - categories on the energy cost workload $_{y. o}$
τ, - time workload, hour.

The sub-unit fulfilled the plan: made a 25 - kilometer march using transport, engineering one hour construction of a firing position, during three hours worked checkpoint mode, then for 2 hours led the defensive battle with the transition to counterattack. After the second counterattack sub-unit was evacuated.

Typically, there are several scenarios for tasks that vary in load and, accordingly, the general matrix for scenarios that are considered may look like Fig. 5.

By analogy with the assessment of physical workload, was assessed information workload , psycho-emotional stress and dynamics of climatic conditions.

For the evaluation task was used a formula (13) that states the successful execution of the assignment and quality implementation of selected components of work with respect to the required values.

Considered subsystem reflects the connection between the environment, functional condition of an organism and the results of work under known conditions. It allows making short-term forecasts and optimizing implementation tasks.

The system a higher level allows making medical component of the plan for security forces both in the short and long term (Fig. 6). Functionally, both systems are closely related.

Long-term planning system consists of vector workflow, vector danger, vector time, information and resource vector and target vector.

Vector workflow is one of the key and universal to system for protection employees. On the one hand it reflects a universal approach to responding to danger, the other provides specificity of action depending on the specific hazard.
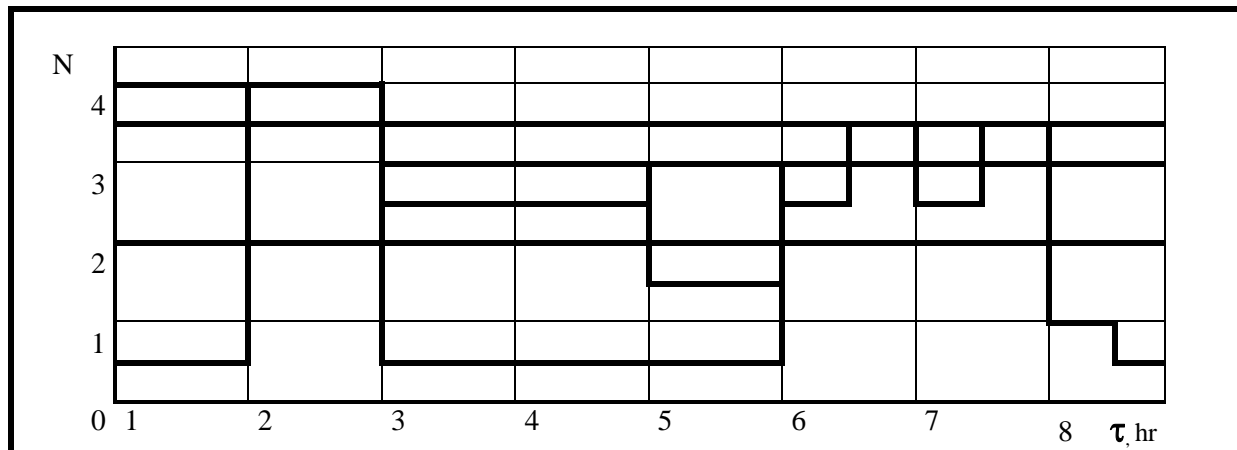
**Figure 5: Example of hour-power parameters for personnel
conditional military sub-unit for several scenarios the task.**

$$E = \frac{N_1 \int_{\tau_o}^{\tau_\phi} f(A_{\Pi\Pi}^{\Phi}) * d\tau}{N_2 \int_{\tau_o}^{\tau_{\text{H}}} f(A_{\Pi\Pi}^{\text{H}}) * d\tau}, \text{this}$$

$$\tag{13}$$

E - efficiency performance;
N_1, N_2 – respectively, number of stages completed and
the total number of stages that must perform.

In a sequence of operations directed at minimizing losses from a specific threat, vector workflow consistently performs the necessary protocols and procedures:

1) Revealing the existence of specific threats and identify its type;

2) Notification;

3) Use medical protectors to counter the danger (drugs and medical equipment for carrying out medical measures to protect military personnel), use preventive and therapeutic antidotes, radioprotectors, vaccines and chemoprophylaxis;

4) Use of technical individual and collective protection;

5) Treatment on the spot and curative-evacuative support;

6) Events for the decontamination of personnel, equipment and areas;

7) Elimination the consequences of danger, restore combat forces, medical units and subdivisions;

8) Analysis of the effectiveness of the system and making necessary changes in its structure and work.

For make necessary procedures and protocols, that provides vector workflow, necessary, that the work was performed vector "information-cost". Information-cost vector conventionally divided into measures of information-planning component, measures organizational and staff structure, measures material and technical resource.

Activities information-planning vector typically includes preparation of legal documents, instructions and recommendations, the management of medical service, development and coordination of plans, system training and retraining of specialists, order and frequency instruction, a system of notification and provide

of operational information, information interaction with commanders of separate parts, heads of departments and services, analysis of the effectiveness of medical services in danger.

This information is necessary for medical personnel for making optimal management decisions to minimize irreversible losses and sanitary losses, maintenance workability personnel and departments, medical assistance to affected using the medical force and resources.

Medico-tactical characteristics of seat danger includes data on type and characteristics of danger, especially its application and features of the lesion factors, duration of damaging actions (resistance of time), lesion area and terrain characteristics, weather conditions, start time of forming the seat danger, predict future development of the situation.

An important component of medico-tactical characteristics of seat danger is data on military personnel, which is in seat danger. His number, available individual and collective protection, experience activity in data danger, trained and adapt to conditions, psychological resistance and others. medico-tactical characteristics of seat danger to predict the number, time and intensity arrival of affected on echelon of medical evacuation, character and structure of the lesions, using drugs and medical equipment for carrying out medical measures of protection and assistance, the need and nature of decontamination.

Organizational and staffing vector is the contribution of all components of vector workflow via organizational protocols and procedures as well as through the establishment of regular staff and irregular structures (posts). So implement staffing support medical protection subsystem.
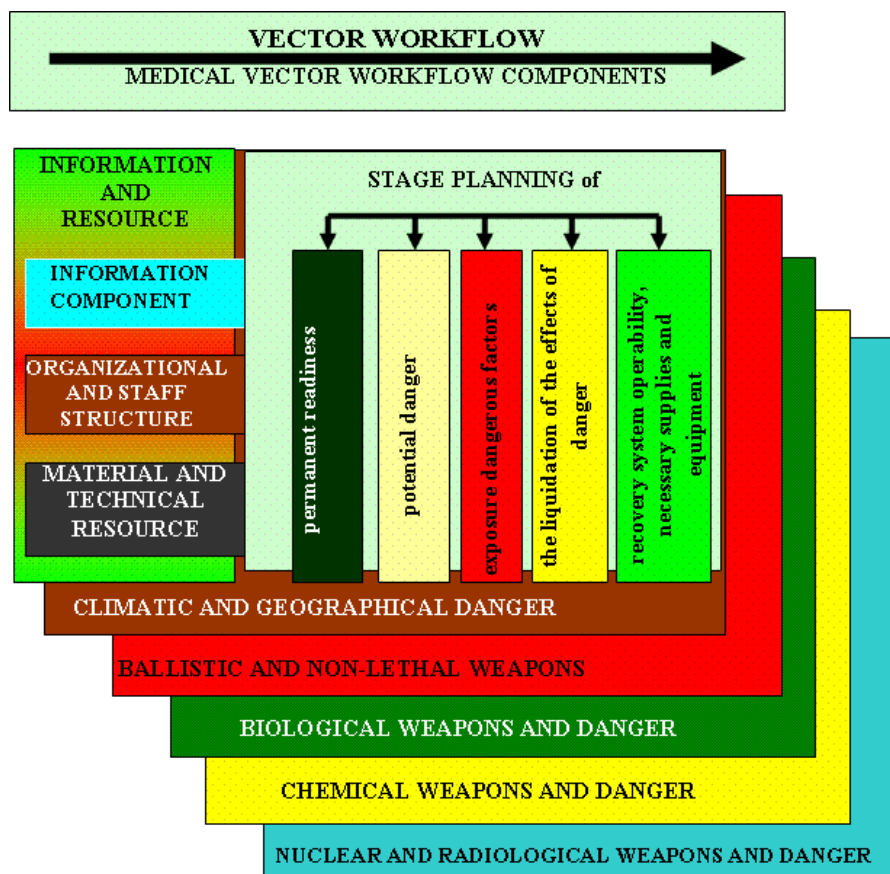
Figure 6: Architecture of long-term planning, using system-vector methodology to the work of medical service.

The material and technical resource vector includes providing the means of individual and collective protection, equipment for detection, notification, special treatment, preventive, curative antidote and other drugs used to assist affected. This list also included the whole list of household and medical items, medical supplies, water and food, which can fulfill the task of medical service in danger regardless of climatic and other conditions.

Vectors (information-planning, measures organizational and staff, material and technical resource) fulfilling certain action, depending on the specific contingent for which they are executed.

To protect troop's medical service, within its competence, solves the problem: providing assistance to affected, providing curative and preventive antidote, education and training of personnel for their use, control of military training, and participation in prevention of psychogenic hazardous conditions, control water supply and food.

Action to protect personnel medical unit and sub-unit conducted in full and include additional shares, the same who carried out commanders military units.

Actions protect the wounded and sick in the stages on echelon of medical evacuation have specifics. They take into account the severity of injuries and particularly the use of Vector workflow protect. Usually distinguished four groups of patients as possible to implement measures to protect.

The first group includes those patients that can independently fully implement actions to protect themselves and to use ordinary individual protective means.

The second group includes those patients who need assistance in implementing measures to protect yourself or use of personal protective equipment. For example, wounded with Hearing Impairments require special notification procedures, upper extremity injuries in need of assistance in donning of personal protective equipment, suffered from mental disorders or inadequate behavior need fixing during the application of personal protection, which prevents their pre-term to strip mask.

The third group include patients who require the use of special individual protective means.

And the fourth of those who can not use personal protective equipment and implement protection measures.

Patient group 2, 3, and 4 require special, equipment, material and technical resource, organization, notification and application of individual protective means.

In separate protocols should describe of interaction with other services, institutions, local and central authorities and the population in terms of vectors (information-planning, measures organizational and staff, material and technical resource).

For example, in the distribution of strongly toxic chemicals (incident, the bomb) and lack of time value of information is extremely large. For organize work we need to know for whom this information must be provided, which content and volume, in which form, in which priority. Also, to do this, add the answer to the question: who will do this, what equipment, where a list of addresses and many similarities.

The same is informational and organizational problems in dealing with the whole complex logistics. Logistics should ensure availability of the necessary material and technical resources in the required place, in the required quantities, at the time when it is needed. This requires the relevant information in the required time. Also needed organizational structure and staff, that this will perform.

According to a systematic methodology, measures of vectors (informational, organizational and staff, material and technical) performed during five stage of planning:

1) Permanent readiness;

2) Potential danger;

3) Exposure dangerous factors;

4) The liquidation of the effects of danger;

5) Recovery system operability, necessary supplies and equipment.

Each of these periods has its own specifics, but all of them aim for implementation security system according to the vector workflow during action of dangerous factor with the highest possible level of efficiency.

One of the most important measures the period of permanent readiness is scientific support protection system, its medical subsystems. This vector is closely linked to the development of new equipment at all stages: from forming medical and technical training requirements to its application in specific situations.

Research Medical Support System Protection provides the following sequence of actions aimed at its development and improvement.

This concept development of medical protection. Defining characteristics of some impressive individual hazardous factors depending on the conditions prevailing. Formation of medical-technical and ergonomic requirements for protection. Search for new scientific and technological solutions in developing remedies. Testing the remedies that have been developed or planned to purchase, according to medical and technical requirements. Find ways to maintain a professional capacity in the application of remedies. Development of algorithms predict safety and professional performance in hazardous conditions. Design guidelines of rules and regulations applying remedies. Development of medical evacuation measures to assist affected. Thus implemented medical support at all stages of life cycle models that are being developed.

CONCLUSIONS

Thus the proposed methodology for system-vector approach to combine results of many studies and actual data in a single model of architecture, standards and principles of decision making that can adequately evaluate and predict the professional activities of man, his physical and mental condition. Based on the methodology proposed ways to improve the planning of peacekeeping, antiterrorist, search and rescue operations. The methodology also allows the system to improve medical support operations, design and evaluate the equipment and personal protection equipment. The methodology can be used to create computer programs information support management decisions.

This allows to create the medical subsystem protection and ensure its most efficient operation with optimal use of financial, intellectual and industrial resources for its improvement.